Patient Information Publications
Warren Grant Magnuson Clinical Center
National Institutes of Health

# Managing Your PICC/SICC Catheter

*Your nursing staff has written this information to explain your new PICC (peripherally inserted central catheter) or SICC (subclavian inserted central catheter). While your doctor or nurse may have already talked to you about why you need a PICC/SICC, you may still have questions.*

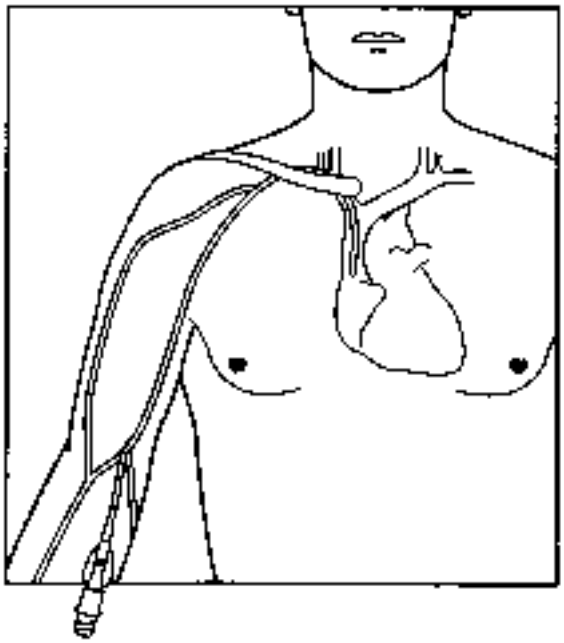
*Your nurse will go over this booklet with you or the person who will be caring for you.*

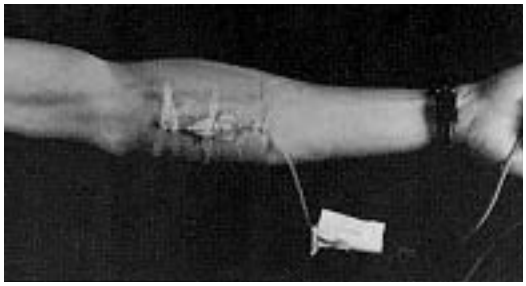
*You will learn how the catheter is inserted, how to flush the catheter, and how to change the catheter cap. You or the person caring for you will also learn how to change the dressing (but you may not be expected to do this yourself). Your nurse will also review safety and cleanliness precautions you may need to take, and what to do when problems arise.*

*Persons who have PICC/SICC catheters manage them well. We encourage you to learn about caring for your catheter so that you can feel confident about it.*

### What is a PICC catheter?

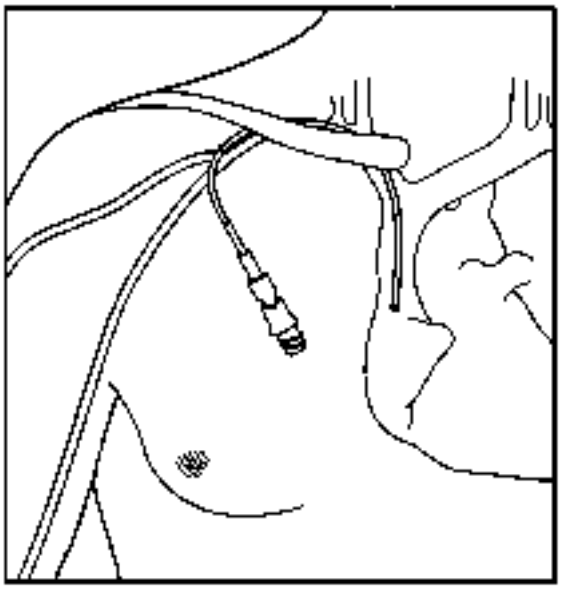
The PICC is a soft, flexible, intravenous (I.V.) line, about 20 to 24 inches long. The catheter is inserted by a doctor or nurse into one of the major blood vessels leading to your heart. The insertion site is in your arm. Depending on your therapy, the catheter may have a single or double lumen (opening). PICCs can be used for drawing blood and for giving intravenous fluids, blood medication, or nutrition.

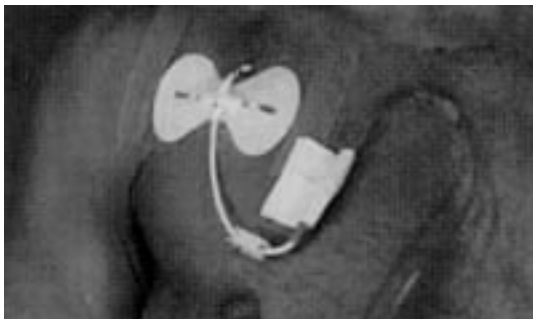




## What is a SICC catheter?

The SICC is a soft, flexible intravenous (I.V.) line, about 6 to 9 inches long. The catheter is inserted by a doctor into one of the major blood vessels leading to your heart. The vessel is usually the subclavian. The insertion site is in your chest. Depending on your therapy, the catheter may have a single, double, or triple lumen (opening). SICCs can be used for drawing blood and for giving intravenous fluids, blood, medication, or nutrition.





## How is the catheter placed?

Before your catheter is placed, your blood will be drawn for various blood tests. Then, the doctor or nurse who will insert the catheter will explain the procedure, the reason for doing it, and the risks involved in placing and using the catheter. Feel free to ask questions at this time.

*Procedure*

- You will be asked to lie down on a bed.
- The vein for catheter placement will be found.
- The skin will be cleansed.
- A sterile sheet will be draped on your arm (for a PICC) or chest (for a SICC).
- If the catheter will be put into your arm, a tourniquet will be placed around your arm.
- You may be given an injection of lidocaine to numb your skin. You will feel a pinprick and slight burning. When the area is numb, the catheter will be inserted.
- The catheter will be held in place by a stitch or another device to hold it down.
- After the procedure, a chest x-ray will be taken to make sure the catheter tip is in the right place.

## How will the catheter feel while in place?

When the catheter is in your arm or chest, you may feel some tenderness. This usually goes away in about 24 to 48 hours.

If the catheter was placed in your chest, there may be an antimicrobial cuff on the catheter under the skin. You may feel it or see it under your skin. This cuff helps prevent infections by stopping bacteria from entering the exit site and traveling up to the vein.

## How to care for the catheter at home

### *Flushing the PICC/SICC*

The catheter lumens must be flushed to keep the inside of the catheter clean and free-flowing.

### *Schedule*

The Groshong PICC/SICC is flushed with 5 mL of 0.9 percent normal saline. Be sure to treat each lumen as a separate catheter. Flush each lumen of your catheter after each use or every 7 days when the catheter is not in use.

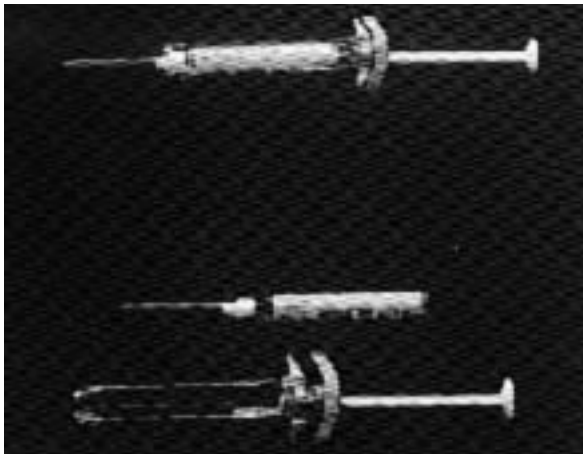
All other PICCs/SICCs are flushed with heparin (1:100 units per mL). Treat each lumen as a separate catheter. Flush the catheter after each use or once a day when the catheter is not in use with 200 units (2 mL) of heparin.

### *Supplies for flushing*

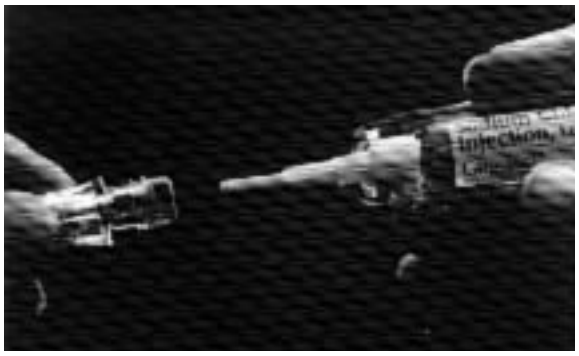
- alcohol prep pads
- 5 mL normal saline (prefilled syringe) or 3 mL 1:100 units heparin (prefilled syringe)
- Carpuject syringe holder

### *Procedure for flushing*

1. Prepare a clean work area. Gather the supplies listed previously.
2. Wash your hands thoroughly with soap and water.
3. Remove the Carpuject syringe holder from its package.
4. Pull back the white plunger as far back as it will go. Turn the blue lock mechanism counter-clockwise. The lock will snap open as you unlock it.
5. Place the prefilled syringe into the holder. The white plastic part of the top of the syringe should fit snugly into the open top of the holder. Once the syringe is lying flat in the holder, turn the blue lock clockwise. It will snap shut as you lock it in place. Next, turn the white plunger clockwise as you screw it into the end of the syringe.



6. Loosen the cap on the syringe tip. Be careful not to touch the tip.
7. Check for air bubbles in the syringe. Note: If there are air bubbles, tap the syringe to make the bubbles rise to the top. Then, gently push the plunger forward to force the air out. *Stop at the 5 mL mark on the syringe of normal saline or at the 2 mL mark on the syringe of heparin.*
8. Hold the catheter in your nondominant hand and scrub the catheter cap with an alcohol swab. Allow the cap to dry.
9. Continue to hold the catheter in your nondominant hand. Remove the tip cover and insert the tip of the syringe into the center of the catheter cap.



10. Unclamp the catheter before injecting the flush solution (if applicable). Inject the solution into the catheter using a push-pause method. Reclamp the catheter (if applicable).

11. Continue pressing in the syringe plunger as you withdraw the syringe tip from the catheter.

12. Turn the white plunger counter-clockwise. Pull the plunger back fully. Twist the blue lock mechanism counter-clockwise. Invert the holder and release the used syringe into a proper container such as a coffee can with lid or a needle box. Never reuse a syringe. (Refer to the booklet "Handling Sharp Objects Safely at Home.") However, do not throw away the Carpuject syringe holder. This will be reused with all syringes.

*Changing the catheter cap*

When you are at home, change the cap to prevent infection and overuse.

*Schedule*

Change the cap once a week, or as needed.

*Supplies*

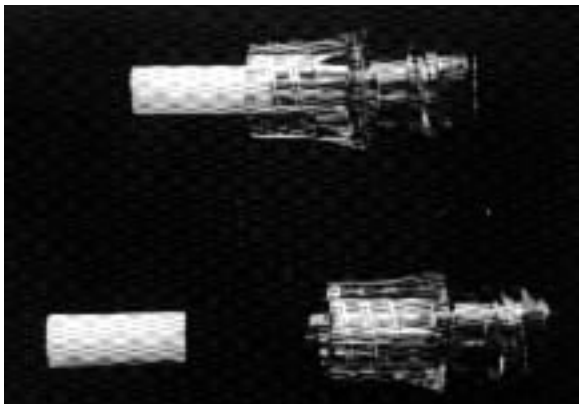
- one alcohol prep pad
- one new sterile luer-lock intermittent infusion cap

*Procedure*

1. Prepare a clean work area. Gather the supplies listed before.

2. Wash your hands thoroughly with soap and water.

3. Open the supplies and place them on the work area. Do not remove the protective tip covering the luer-lock cap. This keeps the cap sterile until you place it on the catheter.



4. Check to be sure the catheter is clamped (if applicable).

5. Hold the catheter in your nondominant hand and scrub the cap-catheter connection with an alcohol prep pad. Let the cap-catheter connection dry.

6. While holding the catheter in your non-dominant hand, remove the old cap from the catheter.

7. Remove the protective tip from the new cap and screw the new cap on the catheter. After the protective tip has been removed, do not touch the sterile tip with your fingers.

## What to do when problems occur

While most patients continue their daily activities without having problems with their catheters, this may occur.

*Air embolism*

This may occur if air enters your vein through the catheter. You may feel short of breath or develop a cough. If this happens, call your nurse or doctor immediately.

*Catheter breakage*

It is rare for your catheter to break or tear, but this can happen. Catheter breakage can be caused by using long needles or other sharp objects on the catheter, too much twisting when changing the cap, too much kinking,

using too much force when flushing. Here is how you can prevent catheter breakage:

- Never use more than a 1-inch needle on the catheter.
- Never use less than a 5 cc syringe when flushing the catheter.
- Avoid putting sharp objects near the catheter (for example, scissors, knives).
- Avoid twisting the catheter. Instead, grasp it by the hub when flushing or changing the cap.

If your catheter does break, you might see that your dressing is wet, or that your catheter leaks when you flush it. Your nurse will give you a smooth-edged clamp to carry with you at all times. If the catheter breaks, immediately place the clamp above the break closest to your skin. Call your nurse or doctor. Many PICCs can be mended.

### *Clotting*

A blood clot may block the flow of fluid through your catheter if the catheter is not flushed right after blood drawing, or if blood backing up in the catheter is not cleared. To prevent clotting, flush the catheter with saline or heparin. If it feels like you cannot push any liquid into the catheter, stop. Do not force the syringe. Call your nurse or doctor.

### *Bleeding*

A small amount of bleeding at the exit site is normal for the first 24 hours after your catheter is placed. However, if bleeding persists, or if the blood leaks through the dressing, apply firm pressure to the site and call your nurse or doctor for help.

### *Infection*

Infection may occur if the exit site is not kept clean and dry. Every time the infusion cap is removed, bacteria may enter the catheter and travel to your bloodstream. If you feel chills after flushing, call your nurse or doctor right away. Closely check your catheter exit site for signs of infection: redness, tenderness, drainage, or pain at the site. If your white blood cell count is low, you will not see drainage or pus. You may also have fever and chills. If you see any signs or symptoms of infection, call your nurse or doctor right away.

### *Thrombosis*

Thrombosis may occur if a blood clot forms and blocks blood flow through the vein where your catheter is placed. Signs of thrombosis are pain and/or swelling in your neck, face, chest, or arm. You may also feel fullness in your face. If you notice these signs, call your nurse or doctor right away.

### *Mechanical phlebitis*

This problem is caused by an irritation of the vein; it is not an infection. Mechanical phlebitis usually occurs within the first 24-48 hours after your catheter is placed, but it may occur up to a week later. Signs of mechanical phlebitis are redness, warmth, tenderness, swelling, or hardness at the site. These feelings may go along the wall of the vein. If you see these signs and symptoms, call your nurse or doctor right away.

This problem may be treated by doing the following:

- apply warm compresses four times a day for 20 minutes, for 2 to 3 days
- raise the affected arm
- do gentle arm exercise
- take anti-inflammatory medication (if prescribed).

### *Catheter migration*

This occurs when the catheter moves from where it was first placed. Migration may be caused by hard coughing, frequent nausea/vomiting, physical activity, or a catheter that is loosely anchored. Signs of a migrated catheter include increased length of the external catheter, swelling in the chest or neck during an infusion, pain or discomfort during the

infusion, no blood return, or leaking at the catheter site. If you think your catheter has moved more than an inch, or if you feel any of the signs and symptoms, inform your nurse or doctor right away.

### Precautions to observe with your catheter

- Always carry the smooth-edged clamp your nurse gave you.
- The catheter exit site should not get wet. Never let the catheter dangle in the tub water.
- Continue your normal activities, including work, school, exercise, and sexual activity. Avoid contact sports.
- Never use scissors near your catheter.

*Take-Home Supplies*

You may pick up supplies for home catheter care from your nurse. The supply kit will contain prefilled 0.9 percent normal saline, or prefilled 1:100 units heparin, two Carpuject syringe holders, alcohol prep pads, and caps. When you are low on these supplies, inform your nurse.

If you had the catheter placed when you were an outpatient, you may get your supplies when you are discharged, the day of the procedure. You may also receive supplies from your nurse during your return visit to the clinic the next day.

### Information for your health care provider

*Dressing change and site care*

Your dressing change should always be performed using sterile technique. Sterile technique means that special steps will be followed to cut down your risk of infection. Since the catheter can be accidentally pulled out during a dressing change, only trained health professionals should change the dressing.

Some medical staff members are unfamiliar with the catheter, and these directions will help them change the dressing easily.

*Schedule*

Dressing change should be done 24 hours after insertion, and every 7 days or when the catheter is soiled or loose.

*Supplies*

- one pair of nonsterile gloves
- one pair of sterile gloves
- three alcohol swab sticks
- three povodine-iodine swab sticks
- two cotton-tipped applicators
- one skin prep swab stick (optional)
- one package of Steri-strips
- one 10x12 cm transparent dressing
- one roll of tape
- one sterile barrier
- one tape measure
- securing material (burn net, tape)

*Procedure*

1. Wash your hands thoroughly with soap and water.
2. Set up a sterile field with supplies.
3. Put on nonsterile gloves.
4. Secure the catheter extension and I.V. tubing to the patient.
5. While stabilizing the catheter, remove old dressing and Steri-strips, working from the edges to the exit site. Remove the dressing in an upward direction.
6. Inspect the catheter exit site, surrounding skin, and vein track for skin integrity, signs and symptoms of infection, phlebitis, swelling, and bleeding.
7. Remove your gloves.
8. Put on sterile gloves.

9. Clean the exit and surrounding skin with an alcohol pad or swab stick. Start on the exit site and work outward in a circular pattern for 3 to 4 inches. Repeat this two or more times with a new swab stick each time.
10. Clean the exit site and surrounding skin with povidine-iodine swab sticks. Avoid getting povidine-iodine on the catheter. Star on the exit site and work outward in a circular pattern. Repeat two more times with a new swab stick each time. Allow to air-dry.
11. (optional) Swab the skin that will be under the dressing with protective skin barrier.
12. Secure the catheter with sterile Steri-strips to provide stability and prevent catheter migration.
13. Loop the catheter. For a PICC, loop towards the shoulder. Avoid the antecubital fossa.
14. Apply transparent dressing over the catheter site. Form an occlusive seal by pinching the adhesive portion of the dressing around the catheter.
15. Measure the length of the catheter from the proximal edge of the catheter sleeve to the insertion site. (If the catheter has migrated in or out more than 2 cm, notify the physician, nurse-practitioner, or physician's assistant to obtain an order for an x-ray to confirm the catheter tip's location.
16. Provide more stability by securing the catheter extension tubing with tape, tubular bandage, or compression bandage. (Do not apply bandages too tightly, or apply tape to transparent dressing.)
17. Remove your gloves. Wash your hands.
18. Label the dressing with the date, time, catheter size, and measured length of the external catheter.

## Drawing blood from a PICC/SICC catheter

This section may be useful when you are away from the Clinical Center and need to have blood drawn from the catheter. Some medical staff members are unfamiliar with the catheter, and these directions will help them to draw blood easily. If they have problems with this procedure, they may contact NIH by using the resource list at the end of this booklet.

### *Precautions*

- To avoid catheter rupture when drawing blood from a PICC, never use a syringe smaller than 10 mL.
- To avoid catheter collapse, never use a vacutainer when drawing blood from a PICC/SICC.

### *Equipment*

- 10 mL syringe with a 22-gauge 1-inch needle or interlink canula attached (for discard)
- 10 mL syringe with a 22-gauge 1-inch needle or interlink canula attached, containing 10 cc of 0.9 percent normal saline.
- 10 mL syringe with a 22-gauge 1-inch needle or interlink canula attached containing 2 cc of 1:100 units of heparin (if needed)
- appropriate syringes (number and size determined by the volume of specimens needed)
- 19-gauge needles or interlink cannula for each syringe needed
- four alcohol prep pads
- intermittent infusion cap
- specimen tubes and labels

### *Procedure*

1. Gather the equipment.
2. Wash your hands thoroughly with soap and water.
3. Cleanse the intermittent infusion cap with alcohol and allow the cap to dry. Note: if the patient has a double-lumen catheter, use the larger port to draw blood.

4. Unclamp the catheter (if applicable).
5. Insert the 10 mL syringe with needle attached. Withdraw 5 mL of blood for discard.
6. If you have trouble getting blood, clamp the line (if applicable), remove the cap, and attach a 10 cc syringe (without the needle attached) directly to the catheter. Open the clamp (if applicable) and try to draw blood. Note: If blood still cannot be drawn, refer to the "Troubleshooting" section.
7. Clamp the catheter (if applicable) and remove the syringe.
8. Cleanse the intermittent infusion cap with alcohol and allow the cap to dry.
9. Insert the syringe with a 19-gauge needle or interlink cannula attached. Open the clamp (if applicable) and withdraw specimens.
10. Remove the syringe, and inject blood into the specimen tubes.
11. Cleanse the intermittent infusion cap with alcohol and allow the cap to dry.
12. Insert the normal saline syringe through the intermittent infusion cap. Briskly inject saline using the push-and-pause method. Remove the syringe.
13. Insert the heparin syringe (if applicable) through the intermittent infusion cap. Briskly inject the heparin. Remove the syringe.
14. Reclamp the catheter (if applicable)
15. Label the specimen tubes.
16. Change the intermittent infusion cap.

## Troubleshooting

If you cannot aspirate blood from the catheter, try these suggestions:

- Check that all clamps are completely open (if applicable).
- Try aspirating more gently. The catheter tip may be touching the vein wall.
- Reposition the patient's arm for a PICC inserted in the arm, or have the patient
- change positions (for example, to lie down rather than sit).
- Ask the patient to turn from side to side.
- Ask the patient to raise his or her arms overhead.
- Ask the patient to take slow, deep breaths.
- Ask the patient to perform the Valsalva maneuver.
- Try flushing the catheter briskly with 5 mL of 0.9 percent normal saline and aspirate back. Never force fluids into the catheter. Urokinase may be used if the catheter is truly blocked. Obtain an order and follow the directions on the urokinase package.

1998

This information is prepared specifically for patients participating in clinical research at the Warren Grant Magnuson Clinical Center at the National Institutes of Health and is not necessarily applicable to individuals who are patients elsewhere. If you have questions about the information presented here, talk to a member of your healthcare team.

Where applicable, brand names of commercial products are provided only as illustrative examples of acceptable products, and do not imply endorsement by NIH; nor does the fact that a particular brand name product is not identified imply that such product is unsatisfactory.

National Institutes of Health
Warren Grant Magnuson Clinical Center
Bethesda, MD 20892

Questions about the Clinical Center?
OCCC@nih.gov